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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/453,831	12/02/1999	KENRO NAKAMURA	04329.2199	3119

7590 01/03/2002  
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EXAMINER

UMEZ ERONINI, LYNETTE T

ART UNIT	PAPER NUMBER
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1765

DATE MAILED: 01/03/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

9k-8

<b>Office Action Summary</b>	<b>Application No.</b> 09/453,831	<b>Applicant(s)</b> NAKAMURA ET AL.	
	<b>Examiner</b> Lynette T. Umez-Eronini	<b>Art Unit</b> 1765	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1) ☐ Responsive to communication(s) filed on \_\_\_\_\_.

2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4) ☒ Claim(s) 1,4,5,11,12 and 17-22 is/are pending in the application.

4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.

5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.

6) ☒ Claim(s) 1,4,5 and 11, 12, and 17-22 is/are rejected.

7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.

8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) ☐ All   b) ☐ Some \*   c) ☐ None of:

1. ☐ Certified copies of the priority documents have been received.

2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.

3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

1) <input type="checkbox"/> Notice of References Cited (PTO-892) 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____	4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) 6) <input type="checkbox"/> Other: _____
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## **DETAILED ACTION**

### ***Election/Restrictions***

1. Applicant's election with traverse of claims 1-12 in Paper No. 5 is acknowledged. The traversal is on the ground(s) that there would be no serious burden on the examiner if all the claims were to be examined together. This is not found persuasive because claims 1-12, which are drawn to a polishing method and classified in class 438, subclass 689 and claims 13-16, which are drawn to a polishing composition and classified in class 252, subclass 79.1, are distinct and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper and would be burdensome to search different inventions in different class/subclass. The requirement is still deemed proper and is therefore made FINAL.

### ***Claim Objections***

2. Claim 17 is objected to because of the following informalities: "teravalent" is misspelled. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

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4. Claim 1 is rejected under 35 U.S.C. 102(e) as being anticipated by Westmoreland (US 6,143,192).

Westmoreland teaches removing all or a portion of a film, layer, or deposit, or other structure composed of ruthenium metal and/or ruthenium dioxide by contacting a region of a subsurface structure with ceric ammonium nitrate (column 3, lines 29-38). The ceric ammonium nitrate material, whether in solution form or otherwise, also may be used as an active chemical component of a slurry for planarizing a surface (column 5, lines 10-12). The material is applied to the surface and acts to remove ruthenium metal and/or ruthenium dioxide from the surface that is planarized (column 5, lines 13-16). Westmoreland's ceric ammonium nitrate solution is the same as applicant's polishing liquid containing cerium (IV) nitrate.

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 4 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Westmoreland (US '192) as applied to claim 1 above.

Westmoreland differs only in failing to teach the Ru compound is  $\text{SrRuO}_3$ , in claim 5.

It is well known in the semiconductor art that Ru compounds are materials that are used in making electrodes. The  $\text{SrRuO}_3$  is an example of a Ru compound.

Hence, it would have been obvious to one having ordinary skill in the art at the time of the claimed invention to modify Westmoreland by replacing a Ru compound with a  $\text{SrRuO}_3$  compound because they are seen as equivalent: they are conductors. Substitution of one for the other would have been anticipated for the purpose of obtaining an unexpected result.

***Claim Rejections - 35 USC § 102***

7. Claims 11 and 17-22 are rejected under 35 U.S.C. 102(e) as being anticipated by Westmoreland (US '192).

Westmoreland teaches a planarizing (polishing) method that comprises:

removing ruthenium metal and/or ruthenium dioxide includes an amount of ceric ammonium nitrate, that may be in the form of a liquid etchant solution, and in one form, and, in one form, the solution may be an aqueous solution wherein ceric ammonium nitrate and, optionally, other solutes, are dissolved in liquid water (column 3, line 42-49), which is the same as preparing a first polishing liquid containing tetravalent cerium ions or cerium (IV) nitrate in a first concentration wherein the ceric ammonium nitrate is the same as applicant's first polishing liquid; and

dissolving the 0.5-70 weight percent of ceric ammonium nitrate and, optionally, other solutes, in water and applying the ceric ammonium nitrate solution to a (Ru) surface (column 3, lines 55-57). Dissolving the 0.5-70 weight percent of ceric

ammonium in water forms a second polishing solution that is more diluted than the first polishing liquid, and is the same as adding a solvent to said first polishing liquid to form a second polishing liquid containing tetravalent cerium ions or cerium (IV) nitrate in a second concentration lower than the first concentration; polishing a surface of a substrate containing Ru or a Ru compound in a surface region with the second polishing liquid, wherein said addition of the solvent is carried out upon or immediately before the polishing of said substrate; and wherein the second polishing liquid does not contain abrasive grains.

***Claim Rejections - 35 USC § 103***

8. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Westmoreland (US '192) as applied to claim 17.

Westmoreland differs only in failing to teach the Ru compound is  $\text{SrRuO}_3$ , in **claim 12**.

It is well known in the semiconductor art that Ru compounds are materials that are used in making electrodes. The  $\text{SrRuO}_3$  is an example of a Ru compound.

Hence, it would have been obvious to one having ordinary skill in the art at the time of the claimed invention to modify Westmoreland by replacing a Ru compound with a  $\text{SrRuO}_3$  compound because they are seen as equivalent: they are conductors. Substitution of one for the other would have been anticipated for the purpose of obtaining an unexpected result.



**Conclusion**

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Hawley's condensed chemical dictionary is relied upon to show that ceric ammonium nitrate contains tetravalent cerium ions and diammonium cerium (IV) nitrate.

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

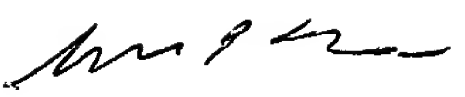
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lynette T. Umez-Eronini whose telephone number is 703-306-9074. The examiner can normally be reached on Second Friday.

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ltue  
January 2, 2002

  
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